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CARBON MONOXIDE

Recently the writer had occasion to be in Billings when a four-place airplane landed with three pilots from the State of Washington The three pilots were professional pilots, all engaged in earning their living as flight operators and came into Billings after dark en route to an aviation meeting.

The pilot flying the airplane parked the aircraft, got out of the plane and walked into the terminal building and took a taxi up town. The other two pilots were not aware that he had left and were considerably confused on where they were and just how they happened to be in Billings.

The last memory that any of the three pilots had of riding in an airplane was at a point approximately 75 miles west of Billings where they had plotted the bearing to the Billings VOR and I was certainly impressed with the apparent shock experienced by all three of the pilots when they found that they had flown into Billings after dark by VOR and that the pilot flying the airplane and both accompanying pilots could not remember how they got there.

A further check revealed that a fatigue crack in an exhaust pipe behind the heater muff allowed the escape of carbon monoxide gas without anyone in the aircraft smelling or sensing the situation. It was by a very narrow margin that these pilots escaped being involved in an airplane accident which probably would have been fatal and unexplainable

It is strongly urged that you give serious consideration to the following quote from the FAA bulletin which was released this month

FAA URGES PRIVATE PILOTS TO CHECK CABIN HEATERS

COLORLESS, TASTELESS, NON-IRRITATING CARBON MONOXIDE GASES FROM AN AIRPLANE'S HEATER SYSTEM CAN MAKE A PILOT UNCONSCIOUS OR SEVERELY AFFECT HIS JUDGMENT OR ABILITY, ACCORDING TO A WARNING ISSUED BY THE FEDERAL AVIATION AGENCY

PILOTS ARE URGED BY THE FAA TO CHECK CABIN HEATERS WHICH USE EXHAUST GASES TO INSURE THAT THE SYSTEMS ARE IN GOOD MECHANICAL CONDITION. ONLY SIX PARTS OF CARBON MONOXIDE IN 10,000 PARTS OF AIR CAN PRODUCE UNCONSCIOUSNESS IN TWO HOURS, THE FAA SAYS. EVEN LESSER CONCENTRATIONS WOULD AFFECT A PILOT'S ABILITY TO FLY SAFELY

POWER LINES

With more and more power developments being installed in Montana, the problem of the hazard of power lines to aviation is becoming increasingly critical. The District Attorney's office in Butte has three cases now on the agenda involving aircraft flying into power lines in Montana. Two incidents of which included fatalities.

If you are flying up or down rivers or canyons, it is important that you keep informed on the location of power lines and keep them in mind when flying at low altitudes or conditions of poor visibility.

Your attention is invited to the following release from the North Dakota Aeronautics Commission.

WARNING TO PILOTS OF LIGHT AIRCRAFT

Harold G Vavra, Director of the North Dakota Aeronautics Commission, issued a warning to all pilots of light aircraft to be on the alert for a new Bureau of Reclamation 2,500 ft. span of power lines crossing the Missouri River about five miles north of Bismarck These lines are supported by 270 ft. towers on both the east and west bank of the river, Vavra said.

AIRLINE SERVICE PATTERN FOR MONTANA

Montana is now served by four airlines including Northwest Airlines, Western Airlines, Frontier Airlines and West Coast Airlines. Many changes will take place in the Montana airline service pattern within the next few years due primarily to advancement in aviation, wherein the trunk airlines are acquiring new large highspeed jet aircraft. It is apparent that these new long-range jet aircraft are not designed for local operations and we have been advised that is is uneconomical to stop these aircraft at distances of less than 500 or 1,000 miles between points.

Our so called local service airlines are also procuring high performance pressurized aircraft designed specifically for short runways and short hauls.

Within a very few years, Montana communities can expect to be served by local service with much improved schedules and with air travel to any point within the United States or on international routes in half the time that it now takes to get there.

A revision of the whole aviation service pattern may be expected and as in the past, **The Montana Aeronautics Commission** stands ready to aid Montana communities in representing them before the Civil Aeronautics Board in the matter of airline service to our communities.

It is strongly urged that the City and County officials and community representatives concerned with airline service familiarize themselves with the CAB procedures as contained in a recent publication by the National Association of State Aviation Officials, the title of which is "Community Planning for Air Transportation." Copies of this new book may be obtained either from the office of the Montana Aeronautics Commisison or by writing to the National Association of State Aviation Officials, 1101 Vermont Avenue Northwest, Washington 5, D C. The publication sells for $2.00 and a limited number are available on loan from the office of the Commission.

FAA PUTS AREA POSITIVE CONTROL PLAN INTO OPERATION

The Federal Aviation Agency has put "Operation Pathfinder," a new concept of air traffic control, into operation in the Chicago-Indianapolis area on October 15, 1960. The program provides for the maximum degree of safety, efficiency and airspace utilization to meet the complex needs of the jet age.

"Operation Pathfinder" is the second step taken by FAA to provide positive control of all aircraft.

In June of 1958, the FAA inaugurated positive control, a method of providing protection to aircraft from collision with all other aircraft during good or bad weather, on three transcontinental airways between 17,000 and 22,000 feet. This system of positive control requires all aircraft along these specific routes to operate in accordance with an air traffic control clearance providing for their separation through the use of non-radar standards. These standards provide for a minimum of 10 minutes time separation between aircraft flying at the same altitude in the same direction. In the case of 600 mile-an-hour jets, for example, the separation would be 100 miles

"Operation Pathfinder" will initiate positive control on an area rather than a route basis. It will provide positive control through radar of all air traffic operating between the altitudes of 24,000 and 35,000 feet The area involved covers 110,280 square miles of airspace overlying the states of Indiana, Illinois, Ohio, and parts of Wisconsin, Kentucky, Iowa, West Virginia and Michigan All aircraft operating within this airspace, whether on airways or off airways, will be under the control of the FAA Chicago and Indianapolis air route traffic control centers which are specially equipped with long range radar.

BEST WE SHOULD GET THAT INSTRUMENT RATING.

NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS

PURPOSE:—"**To foster aviation as an industry**, as a mode of transportation for persons and property and as an arm of the national defense; to join with the Federal Government and other groups in **research, development**, and advancement of aviation; to develop uniform aviation laws and regulations; and to otherwise encourage co-operation and mutual aid among the several states."

MONTANA AIRPORT PROGRAM

1957 - 1960

THREE AND ONE HALF MILLION DOLLARS

The Montana Aeronautics Commission has participated with local communities and the federal government in the sponsoring of thirty-five airport projects in Montana within the last four years between the dates of August, 1957 and August, 1960.

State airport funds, derived from a 1¢ per gallon tax on aviation fuel, have been used in giving very material aid to Montana cities and counties for the development of many justified and needed airport projects.

State Aviation funds have been given to Montana communities in grants for preliminary engineering costs in the preparation of estimates for both federal and local airport projects. This procedure has alleviated a bottleneck wherein it has heretofore been difficult to finance the cost of preliminary engineering due to city and county budgetary requirements. In many cases, a very justified airport project could not be initiated because funds were not available to determine the probable cost of the project.

The Montana Aeronautics Commission has constructed several emergency and recreational airstrips with the use of State funds alone and in one case, in the development of a recreational and border airstrip jointly with the Province of Alberta.

State participation in airport building has been a very material contribution to the aviation industry in Montana within the last four years.

It may be noted that your 1¢ tax on aviation fuel has contributed very materially to the development of many Montana airports, which in turn very apparently increase the utility of your airplane.

Your suggestions and comment on the airport development program sponsored by the Montana Aeronautics Commission will be appreciated and will be given careful consideration.

Your attention is invited to the folowing list of expenditures on Montana airport projects.

AIRPORT FUNDS

August, 1957 to August, 1960

	State Funds	Federal Funds	Local Funds
Wolf Point		45,334.29	39,910.21
Plentywood	7,195.00	30,653.25	19,651.75
Havre	1,200.00		28,000.00
Elliott Fld. (R. Creek).	13,759.70		Property
White Sulphur Springs	17,997.97		1,100.00.
*Ross Fld. (Coutts-S. Grs.)	11,738.50	5,400.00	
Fort Benton	10,000.00	34,459.00	22,000.00
Browning	16,145.00		
Lincoln	13,117.00		
Canyon Ferry	6,500.00		
Butte		143,482.00	126,018.00
Dillon	10,499.00	28,217.00	14,781.00
Malta	9,900.00	18,698.00	7,800.00
Conrad	10,599.68	30,382.50	16,203.02
Tiber Dam	8,000.00		
Miles City	9,900.00	51,331.00	35,183.00
Dell	2,000.00		
Billings	49,500.00	851,383.00	722,493.00
Great Falls		130,749.52	126,861.00
Babb	32,389.09		
Chester	10,500.00	31,445.00	20,059.00
Bozeman	1,000.00		
Glasgow	10,150.00	16,326.00	24,749.00
Livingston		26,232.11	26,232.11
Laurel	2,000.00		4,500.00
Meadow Creek	5,000.00		5,000.00
Columbus	5,270.00		7,100.00
Bridger	11,000.00	5,000.00	4,000.00
Kalispell	11,834.92		
Missoula		232,595.60	220,111.00
Ox Bow	5,000.00		
Helena	1,000.00		24,800.00
Superior	500.00	114,600.00	
Red Lodge	11,000.00		
Scobey	10,000.00		
	$314,695.86	$1,795,748.16	$1,496,555.09
$3,606,999.11			

*One half of the funds for this project were furnished by the Province of Alberta.

VIOLATION
AL DUNN, A COMMERCIAL PILOT, WAS PLANNING TO FLY TO CONCORD. CHECKING WEATHER HE FOUND HIS DESTINATION HAD A 1600 FT CEILING AND LOWERING.
CONCORD IS FORECASTING 400 FT IN THREE HOURS... YOU HAVE AN INSTRUMENT TICKET?
NO, BUT ALMOST READY FOR IT!
AL WAS ADVISED NOT TO GO,... SO, WITHOUT FILING A FLIGHT PLAN, HE AND HIS TWO PASSENGERS TOOK OFF... FOUR HOURS FUEL ON BOARD. ALMOST FOUR HOURS LATER CONCORD ATC RECEIVED A FRANTIC CALL
CONCORD RADIO... MAYDAY 611... LOST IN THE OVERCAST
611... CONCORD, WHAT IS YOUR POSITION AND HEADING?
DON'T BOTHER ME... ...LEAVE ME ALONE!!
CONTINUOUSLY CONCORD ATTEMPTED TO MAINTAIN CONTACT WITH 611
IT'S BEEN TWENTY MINUTES SINCE 611 REPORTED FIFTEEN MINUTES FUEL. ANY LUCK?
HE CAME BACK ONCE... I ASKED HIS POSITION, HE SAID HE WISHED HE KNEW
AND THE FOLLOWING MORNING
CALL CONCORD TO CANCEL THE AIR SEARCH. WE'VE FOUND 611 NO SURVIVORS.
THIS ACCIDENT COULD HAVE BEEN AVOIDED, BUT A WILLFUL VIOLATION OF COMMON SENSE AND C.A.R. LED THE PILOT BEYOND HIS LIMITS. DON'T PUSH LUCK. KNOW YOUR LIMITS, YOUR RATED LIMITS... AND FLY WITHIN!!

STATE CREDIT CORPORATION

A new company, organized to serve Montana's flying public commenced active operations recently, a group of state businessmen announced. The new firm, which is known as the STATE CREDIT CORPORATION, is a publicly owned finance company and seeks to serve principally in the aviation finance field. The new company, which became active in the aviation finance business last month, is managed by Jim Shennum, well known Montana pilot and businessman. The Company is off to a good start, Shennum stated, and will welcome inquiries from people who are interested in financing aircraft. Such inquiries can be made either by letter, or by a collect telephone call to their offices in Scobey, where the company is currently headquartered.

FAA TO STANDARDIZE TRAFFIC PATTERNS AND PROCEDURES

The Federal Aviation Agency has proposed rules to standardize the flight operations of all aircraft operating in the vicinity of all airports with the primary aim of enhancing air safety in the vicinity of airports and reducing aircraft noise affecting airport communities.

The rule-making proposal marks the first time the Agency has proposed the adoption of national standards for traffic pattern rules governing flight operations on and around all airports.

The proposal would create an airport traffic area around each tower-equipped airport that would take in the airspace below 2,000 feet within a radius of 5 miles of the center of the airport. Any pilot not intending to land at the airport would be prohibited from flying through this area unless he received the tower's permission to do so.

Such a standard airport traffic area is believed necessary by the FAA because of the number of near midair collision incidents which have been caused by the interference of enroute aircraft operating in airport traffic patterns.

The proposal would also limit airspeeds of aircraft operating in the traffic area around controlled airports to not more than 180 miles per hour. If the operational limitations for a particular aircraft require greater speeds for reasons of safety, then the speed would be limited to the minimum necessary for the safe operations of that aircraft. The proposed rules call for two-way radio communications at all airports where a traffic control tower is in operation by either the FAA or military authorities. The FAA believes that safety objectives would be risked unless instantaneous and continuous radio communications are maintained by the tower with all aircraft operating at controlled airports where traffic is complex and includes high-speed flight operations.

The proposed regulation, however, includes a provision permitting aircraft not equipped with two-way radio to land at or take off from a controlled airport if prior authorization is obtained from the tower.

Under the proposal all aircraft (even at the uncontrolled airport) where a Flight Service Station is located will maintain two-way communication with such station within 5 statute miles of the airport.

Slow aircraft, 105 knots or less (125 MPH) are to fly at a traffic altitude of 800 ft.—1,000 ft. while fast aircraft in excess of 105 knots are to operate at 1,500 feet above the surface. The airport traffic area entry procedure calls for at least 1,000 ft. above terrain for slow aircraft and at least 1,500 ft. for fast aircraft.

Again at uncontrolled airports, landings shall conform to the standard lefthand traffic pattern unless otherwise specified. The departure from an uncontrolled airport shall conform to the traffic pattern established for that airport by appropriate authority.

The complete proposal (CFR Part 60) can be reviewed in the Federal Register of Friday, October 14, 1960, Vol. 25, Number 201.

Persons interested in commenting on the proposed airport traffic area rules (Reg. Docket No. 531; Draft Release 60-17) may submit their communications, in duplicate, to the Docket Section, Federal Aviation Agency, Room B-316, 1711 New York Ave., N. Y., Washington 25, D. C. All comments received prior to December 15, 1960 will be considered before rule-making action is taken

REVISED AVIATION MECHANICS BOOK OUT

An important and helpful book for aviation mechanics and students, the 15th revision of "Civil Air Regulations and Reference for Mechanics," has just been released.

Containing Federal regulations applicable to mechanics working on either aircraft, airframe or engine, the 152-page book tells explicitly what a mechanic must do, can or cannot do when he is constructing, repairing or maintaining any type of airplane, glider or rotorcraft and /or their powerplants

For students desirous of becoming aviation mechanics, a section of the book contains information about necescsary mechanical knowledge, experience, and skill requirements as well as examinations procedures and a listing of sample test questions and answers.

There are also 250 check questions for mechanics to use to test their knowledge, samples of forms and also instructions a mechanic must follow in order to obtain an "inspection authorization."

The new book, available in hard binding at $4 50 and in heavy paper cover at $2.95, may be obtained from bookstores, airport supply dealers or by mail from Aero Publishers, Inc., 2162 Sunset Boulevard, Los Angeles 26, Calif.

INTERNATIONAL NORTHWEST AVIATION COUNCIL ANNUAL MEETING HARRISON HOT SPRINGS, BRITISH COLUMBIA

1960

Our Canadian neighbors to the north were hosts to representatives of aviation groups at the annual meeting of the International Northwest Aviation Council, which was held this year at Harrison Hot Springs, British Columbia.

An outstanding feature of the program was a dinner address by the Honorable J. R Baldwin, Deputy Minister of Transport for Canada.

Those of us who were fortunate enough to attend this meeting were certainly impressed by the speech given by the Deputy Minister, who heads Canadian Civil Aviators. His reference to aviation literature showed that he had a keen appreciation for the art of flying, which has now been submerged in the cold, hard facts of our major industry.

Mr. Baldwin referred to several outstanding literary aviation writings, one of which I have had the pleasure of reading and which I would highly recommend to pilots who have experienced the acceleration stimulated by the pure love of flying. He referred to a book, the title of which is "Wind, Sand and Stars," which was written by a dynamic French pilot, Antoine St. Exupery. I would strongly recommend that you get this book and read it.

Many of us who heard the excellent talk by the Honorable J. R Baldwin recognized the Parellel of the Canadian analysis to our airport program. He went on to state that it would be very desirable if Canadian Provinces would establish Provincial Aviation Agencies patterned after the State Aeronautics Departments which we have in our Country.

All aviation people who attended this annual meeting of the International Northwest Aviation Council profited very materially by the program which included excellent talks and informative information valuable to anyone associated with Airport Administration or airport development and the grass roots of aviation.

It is strongly urged that you make an effort to have your city and county airport officials attend the next meeting which will be held in Spokane, Washington in the Fall of 1961.

INTERNATIONAL NORTHWEST AVIATION COUNCIL DINNER, HARRISON HOT SPRINGS, B.C. SEPTEMBER 27, 1960, ADDRESS BY THE HONORABLE J. R. BALDWIN, DEPUTY MINISTER OF TRANSPORT, OTTAWA, CANADA

This particular conjunction of people has taken place for several reasons. To the normal gregarious instincts of man which are particularly manifest in the North American love of conventions, with or without wives, there can be added your own recognition and an increasing public awareness of the services that aviation can perform for man. Even above this is the inherent love of flying for its own sake that I know is rooted well among you.

You and I, who may not be masters of the inscribed word, perforce must make our love of flying known in simple fashion; through the performance of the act itself; through steadfast adherence to those activities, persons and groups who form its orb; and through all the associations that are the commonplace of the aviation mind.

Yet there have been a few, but only a few, whose poetic command of the language expressed in both verse and prose have somehow, by the turn of a sentence or the sequence of a phrase, expressed the best of that curious physiological and psychological reaction that is the awareness of the true flyer. This some among you must have felt at some time even though we may lack the strength and ability of oral or written description. I have always been interested in finding authors who possess this ability. Neville Shute and Ernest Gann have the quality in a number of their novels, particularly in "No Highway" and in "The High and the Mighty," where their own direct experience of aviation makes itself felt. Here this peculiar "awareness" of the flyer to which I have referred is represented by experience, rather than by the supreme turn of phrase.

Anne Morrow Lindberg, less well known to the more youthful among you but certainly a familiar name to my own contemporaries, caught the poetic quality of aviation once or twice. Pierre Clostermain, the great French pilot whose name may be known to some of you from World War II days, came even closer to it. Any of you who read his book "The Big Show" will recall his description of his final flight in his favourite fighter aircraft which he had christened the "Grand Charles." I quote:

"Coming back I had taken him high up in the cloudless summer sky, for it was only there that I could fittingly take my leave. Together we climbed for the last time straight towards the sun. We looped once, perhaps twice, we lovingly did a few slow, meticulous rolls, so that I could take away in my finger-tips the vibration of his supple, docile wings.

And in that narrow cockpit, I wept, as I shall never weep again, when I felt the concrete brush against his wheels, and with a great sweep of the wrist dropped him on the ground like a cut flower."

Beyond all this, however, I have marked out for my own satisfaction, two men; one of these had a distinguished carrer both before World War II and during that conflict, and when I tell you that his flying experience included early pioneering in France, North Africa and South America along with active war duty, you will grasp my reference to Antoine St. Exupery, whose "Wind, Sand and Stars' 'is, I believe, unexcelled in its almost metaphysical appreciation of flying; and whose works such as "Night Flight" and "Flight to Arras" should be classics in literature for the lover of aviation.

I have selected just three unrelated sentences from different works in which he described his own personal reaction to the mater of flight. I would like to read them to you. They are as follows:

"And yet we have all known flights when of a sudden, each for himself, it has seemed to us that we have crossed the border of the world of reality; when, only a couple of hours from port, we have felt ourselves more distant from it than we should feel if we were in India; when there has come a premonition of an incursion into a forbidden world whence it was going to be infinitely difficult to return."

"The squall has ceased to be a cause of my complaint. The magic of the craft has opened for me a world in which I shall confront, within two hours, the black dragons and the crowned crests of a coma of blue lightnings, and when night has fallen, I, delivered, shall read my course in the stars."

"For me, piloting my plane, time has ceased to run sterile through my fingers. Now, finally, I am installed in my function. Time is no longer a thing apart from me. I have stopped projecting myself into the future. I am no longer he who may perhaps dive down the sky in a vortex of flame. The future is no longer a haunting phantom, for from this moment on I shall myself create the future by my own successive acts."

Richard Hillary, a brilliant and courageous British flyer, possessed many of the same qualities although his descriptive passages seem to me a little purer and less tinged with mysticism than those of St. Exupery. This is best expressed in a couple of excerpts from the autobiography he wrote shortly before his too early death. I take the libery of quoting from this work published under the title of "The Last Enemy."

"The awful feeling of being shut in was gone, and I began to enjoy myself. I was released, filled with a feeling of power, of exaltation. To be up there alone, confident that the machine would answer the least touch on the controls, to be isolated, entirely responsible for one's own return to earth—this was every man's ambition and for a moment I had nearly lost it."

"Of cloud and formation flying. I shall never forget the first time that I flew really high, and, looking down, saw wave after wave of white undulating cloud that stretched for miles in every direction like some fairy city. I dived along a great canyon; the sun threw the reddish shadow of the plane on to the cotton-wool walls of white cliff that towered up on either side. It was intoxicating. I flew on."

To anyone who loves the actual experience and sensation of flying, I commend the savour of these writings. To any among you who may have knowledge of others whose capabilities in this field you consider equal, I would beg of you to pass on to me their names since the tasting of literature of this type carries with it a special delight.

However, I cannot spend all the evening, much as I would like to, in a purely literary delectation and I wish to talk to you directly about assistance you can provide to the growth of civil aviation in Canada.

I refer particularly to the matter of small airports and airstrips and the importance of having more of these in Canada.

Arising primarily out of wartime experience, the federal government in Canada has assumed the responsibility for providing major airports across the country but this is purely a matter of historical growth. There is no constitutional or legal duty placed upon the federal government to assume this responsibility.

As the needs of civil aviation have grown and as in consequence the capital expenditure of the federal government in Canada on airports and related facilities has increased, it was necessary for the government to undertake some definition of the extent of its responsibilities. Arising out of this, the conclusion was reached that the provision of the major airports required for scheduled and regular commercial air services in Canada, i.e. the funds necessary for their construction, should come from the federal government but that this responsibility need not and should not extend to smaller airfields not required for regular scheduled commercial air services. In these other fields, the federal government reached the conclusion that it is not unreasonable to expect other groups, private, municipal or provincial, to assume some responsibility, although as an encouragement to other groups the federal government maintains a system of capital grants for this purpose.

In other cases, in remote and unsettled areas where ground transportation facilities are very poor or non-existent, and where a small community may exist, we may make a grant-in-aid to a local entity for the development of a small airstrip, providing some local group can be found to assume responsibility for operation of the strip. This category of grant-in-aid, which is limited to $50,000, applies primarily to grass or dirt strips for the use of light aircraft, although basically in this and in other categories we try to hold to the principle that the site itself must at least be possible of ultimate development to 4,000 feet as a means of protecting the future. Many small strips in remote areas have been constructed with the help of these grants.

In still other cases, usually in the more settled areas where there is interest in a local strip to serve private or non-scheduled aircraft of the smaller size, but other transportation is available; and where no regular scheduled air service exists, the federal government may assist by sharing the cost providing a province, municipality or some local group will also share the construction costs and assume responsibility for operation. This cost-sharing grant is aimed primarly at providing smaller strips suitable for private and executive aircraft of the smaller size, and the federal grant is limited to a maximum of $100,000 to be matched by local funds. This type of grant too has played a part in the development of smaller fields in a number of our towns.

You may wonder why I have talked about this subject. I believed that any group containing a substantial number of members interested in light aircraft, would be interested in knowing how the problem of physical facilities is approached in Canada. What I have described is not a new policy. It has been stated by the Minister of Transport before. However, I feel it is important to take every opportunity to emphasize the need to develop by every possible means a greater local consciousness with regard to the need for facilities for small aircraft and the idea of local responsibility. Unquestionably, if your purposes are to be achieved, we need more facilities for small aircraft in Canada and more direct participation at levels other than the federal government.

Your Association and other groups in the West, such as the B. C. Aviation Council, have done a great deal already. In this particular province the provincial government has shown considerable interest in this problem. However, there is still widespread across the country a general feeling at many levels that the federal government has the responsibility for providing everything that aviation needs in Canada from the smallest grass strip to the largest international airport. The purpose of my remarks has been to emphasize the need for recognition of and acceptance of some local responsibility for fields for small aircraft for both private and executive use if this area of transportation is to have the chance to expand and provide the great service to Canadian business that it can provide.

If you seek to further this objective, you should be prepared to prove substantial benefits will result from these smaller fields. I believe this can be proven that requests for smaller fields are not just thoughtless requests for facilities of little importance. Improved and expanded facilities for light aircraft do actually benefit Canadian business and the Canadian economy in improved business transportation and communications, and in better tourist facilities in a field in which there is an increasing tourist interest.

I understand that at another aviation meeting here a week or so ago, the statement was made that the Department of Transport has not done enough to provide lighting and aids to navigation at airports in British Columbia and that in consequence handicaps have been placed upon night and bad weather flying. It would not be seemly or proper for a civil servant to embark on public controversy and I intend therefore to avoid any such course. However, I can at least state the facts in this regard.

In the province of British Columbia, quite apart from Vancouver airport, there are 23 airports which have been equipped with the necessary lighting and aids to navigation to permit night flying at a cost of quite a few millions of dollars. Every year this programme is extended either by addition of new fields or by improvements at existing fields. Moreover, the Department, under standing arrangements, welcomes submissions from air carriers and other interested groups and determines its program in this regard on the basis of not just its own knowledge but on the basis of suggestions and requests received within the limit of funds that may be voted from year to year.

WINTER'S COMING!

. . . . and with it a whole new set of seasonal problems As a prelude to the "Boning-up" exercise on winter operations, consider the following rehearsal cues for both turbine and piston-engine aircraft crews. We realize these "cues" are well known to you, and only offer them as a sort of refresher. If you have some you would like to add to it, let us know and we will add them for the benefit of all.

Careful planning is the key to minimizing the effects of winter on safe and efficient flight operations.

READ THE FORECASTS.
STUDY THE WEATHER MAP.
CHECK THE WEATHER SEQUENCES.
PLAN YOUR FLIGHT ACCORDINGLY AND CAREFULLY.

REMEMBER . . .

1. As cold air masses clash with early fall warm air masses, upper winds increase sharply and sudden intense storm centers develop along cold fronts. Result—dense cloudiness, heavy turbulence, extensive icing.
2. Flight crews can expect higher incidence of near-or below limits ceiling, visibility, and fog during winter months.
3. The stronger winds introduce extra measures of gustiness which can create problems in landings and takeoffs.
4. Wind shear over hilly approaches or near hangars and large buildings is unpredictable and hazardous; intensity varies with wind speed. If upper winds are on the tail on let-down, wind shear tends to produce overshooting; if on the nose, watch out for downdraft-type stalling.
5. While radar is the tool for keeping track of obscuring precipitation, snow obscuration sometimes offers little or no echo return. This condition, therefore, must be watched for on weather reports, broadcasts, etc.
6. Be alert to the jet stream and keep a check on its possible location. During the winter it is not unusual for the jet stream to be found at considerably lower altitudes than expected.

Flight Safety Foundation, Inc.

NASA sounding rockets have measured 600 mph winds at altitudes of 150 miles. A sounding rocket is a small rocket that takes a light payload of instruments into the upper layers of the atmosphere and ionosphere—usually no higher than 200 miles.

PILOT REGISTRATION 1961

IT IS SUGGESTED THAT YOU IMMEDIATELY FILL IN THE ENCLOSED PILOT REGISTRATION CARD FOR THE CALENDAR YEAR 1961 AND RETURN SAME TOGETHER WITH $1.00 TO THE OFFICE OF THE MONTANA AERONAUTICS COMMISSION SO THAT YOU MAY CONTINUE TO RECEIVE THIS NEWSLETTER.

LUNAR TV STATION PLANNED

The Kin-Tel division, Cohu Electronics, is doing preliminary work on a television station for the moon. System would be self-contained camera, transmitter and telemetry package rocket-boosted to the moon and "soft landed." Telemetry system would be used for remote control of the camera.

WEATHER—PLAN AHEAD

(a) Pre-flight—Weather study establishing 'enroute forecast," "enroute conditions" and "escape route" to good weather.

(b) In Flight—Never get even close to losing good "ground reference" control—when encountering 1,000 feet or 5 miles plan retreat to good alternate airport and execute retreat encountering 800 feet ceiling or under 3 miles visibility. (Unless current and qualified for I.F.R.)

(c) On Top—Never, except over widely scattered clouds, and then only provided there is at least 2,000 feet from highest ground to cloud base. (Unless current and qualified for I.F.R.)

(d) Night—Never, unless assured of 2,000 feet ceiling and 5 miles visibility and assured that no frontal or ground fog, or storm conditions will be encountered. (Unless current and qualified for I.F.R.)

National Aviation Insurance Group.

ANSWERS TO LAST MONTHS QUIZ
ARE YOU CURRENT?

1. (C)
2. (C)
3. (C)
4. (D)
5. (B)
6. (C)
7. (A)
8. (C)
9. (D)
10. (B)

80-100—You are current.
Below—Review necessary.

FOR SALE—Continental A65 with 72-42 wood prop, complete except carb., 100 hrs. SMOH, a good running engine. $195. Contact Emmell Blomquist, Rt. 1, Box 42, Dillon.

FOR SALE—1960 Cessna 172, 250 hours TT. Like new. $8500. firm. Jess W. Owen, Missoula Aerial Service, Box 1158, Missoula, Phone LI 2-2841.

FOR SALE—North American Navion, 0 hrs. TT engine; TT air frame 1600 hours, continental 225 HP, VHF-LV-ADF Omnigator, full panel, new tires, newly rebalanced constant speed prop, newly licensed, very clean. $9,750. Marvin Beck, phone 125, Deer Lodge, Montana.

FOR SALE—Two Piper PA 18's 125 HP. One Piper PA 16, 115 HP. Bob Lonnevik, Conrad, Montana, CR 8-3797.

FOR SALE—1946 all metal Luscombe 8E, full electrical, LF radio; new tires, glass, interior, battery, paint, pants. Da-Glo. 146 STOH. Also have extra Hartzell 100 HP ground adjustable prop, and set of 3 Federal 1500 skis with harnesses. Royal Turley, Three Forks.

FOR SALE—Ercoupe 415C, zero SMOE on C85-12, new wing fabric, new custom interior, soundproofing, all new tinted glass, new battery, metal prop, Lear LTRA-5, VHF transceiver, all bulletins including spar & rudders, new license, John Stevens, Twin Bridges, Phone MU 4-5666.

FOR SALE—1958 S. C. Tri-Pacer Superhomer, LFR-3, full panel, 710 total hours eng., 254 since top, annual due December 60. As is $5500., will annual for $5800. B. Bounds, 723 Lincoln Drive, Malmstrom AFB, Montana, GLendale. 2-6694.

FOR SALE— 1947 Cessna 120, 175 hrs. SMOH, two years on new Irish linen wings, new windshield, tires, brakes, upholstery, full panel and electric system, new VHF radio. $2500. Will finance or trade. Mark Gilleland, 622 South Black, Bozeman, Phone JU 6-6128.

FOR SALE—1947 Cessna 120, serial 14084, total time 1000 hrs., 125 hrs. since major overhaul on C 85-12 engine, new metal prop, new tires, new windshield and door glass, brand new wing covers, complete new custom upholstery, new rug, exceptionally clean, new license. $2275. Henry F.Meine, Route No. 1, Dillon, Phone MU 3-2525.

WANTED TO BUY—Side by side 2 place airplane—must be certified. Mr. Mac Cummings, Box 488, Fort Saskatchewan, Alberta, Canada.

FAA QUARTERLY INSPECTION ITINERARY

City	Airport	Jan.	Feb.	Mar.
Billings	Municipal	9, 16, 23, 30	6, 13, 20, 27	6, 13, 20, 27
Bozeman	Gallatin Field	18* 19**	15* 16**	15* 16**
Butte	Silver Bow County		14	
Glasgow	Municipal	11	8	8
Glendive	Municipal	18	15	15
Great Falls	International	11* 12**	8* 9**	8* 9**
Havre	City-County		7	
Lewistown	Municipal	25		
Miles City	Municipal	19	16	16
Missoula	Msla. County	25* 26**	23* 24**	29* 30*
Plentywood	Municipal & County		9	
Wolf Point	Anderson & Municipal	12		9

*Written examinations
**Flight tests

CODE OF THE PROFESSIONAL AVIATOR

My aircraft is my life and the life of my passengers. It serves me only as well as I serve it.

I know myself, my true knowledge and proficiency. I will never place myself in a position which exceeds them.

I will always base my confidence on good judgment derived from my knowledge and state of proficiency. I will never allow false pride to impair my judgment.

I will always be a student aviator. I will never be too old or experienced to learn.

I will strive constantly to eliminate my faults and correct my weaknesses. I will never lower my personal standards and accept mediocrity.

Only through a deep personal pride and constant striving for perfection can I be and remain

A PROFESSIONAL AVIATOR

National Aviation Insurance Group

WHICH IS BETTER FOR I.F.R.
? ? ?

Former B-29 pilot, now Massachusetts Aeronautical Director, gives important tips on single engine IFR.

It's seldom you find an articulate, well-known pilot with plenty of multi-engine time publicly defending single-engine instrument flying. But such a man is Crocker Snow, former B-29 pilot who now flies his single-engine Navion IFR around the country as Massachusetts Aeronautics Director.

"I'd much rather have two pilots than two engines for IFR flight," Snow told a National Pilots Association symposium at the recent Reading (Pa.) Aviation Show.

Snow admitted that quite a few people, some with lots of flying experience, believe single-engine IFR "is sort of queer." "I can't see why," he went on. "It's certainly not new. Many tons of air mail were flown IFR in the 20s with Pitcairn Airwings, Stearmans, DA4Bs, old Douglas single-engine airplanes."

"It's not unusual. A five-Bonanza operation in nearby Harrisburg flies IFR and has something like a 95 per cent completion factor. That's good in any league."

Snow added that he's been unable to find any statistics showing that properly equipped single-engines flown by qualified pilots have run into trouble because they have only one engine. "In fact, it's hard for me to understand how anybody can get any real use out of an airplane, at least in this part of the world, unless they do fly IFR. I wouldn't be here today. We came out just north of Boston IFR all the way through a front with a number of thunderstorms," he said.

Snow finds legal en route instrument flying harder today than it was 30 years ago, despite the great improvements in radios and radio navigational aids. Airplane stability hasn't changed much in 30 years, he said, and the instruments single-engine pilots use look just about the same as they did 30 years ago.

"The difference," he said, "is the increasingly complicated communication and ARTC (Air Route Traffic Control) procedures, caused by the much greater amount of instrument flying today. This has often led me to observe that I'd much rather have two pilots than two engines for IFR flight, and I mean it or two radios, or two omnis."

AIRCRAFT INSPECTION FAA REQUIREMENTS

We have had a recent experience in the matter of aircraft inspection which leads us to believe that there may be aircraft owners in the State who are not familiar with the different types of inspection required on their aircraft at this time by the FAA. It is required by the FAA that all licensed aircraft have a periodic inspection every twelve months and this inspection must be made by a designated airplane and power plant mechanic.

An airplane operated privately and not for hire is not required to have a 100 hour inspection. It may be noted that the periodic inspection is acceptable in lieu of a regular 100 hour inspection; however, a regular 100 hour inspection is not acceptable by the FAA in lieu of the required periodic inspection. Any mechanic with an airplane and power plant rating can do a 100 hour inspection, but only an A & P mechanic with inspection authorization can do the periodic inspection

If you own an airplane, be sure that you get your periodic inspection and be sure that an A & P mechanic with inspection authorization makes the proper entries in your aircraft log book, stating that he has completed the required inspection.

If your aircraft is operated for hire, be sure that both the 100 hour inspection and the periodic inspection are made and proper entries made in the aircraft log book.

FAA inspectors are taking a new hard look at aircraft log books. It is suggested that you check your log book and see if your aircraft inspections conform to the above requirements.

HELENA

THE HELENA FAA FLIGHT SERVICE STATION IS NO LONGER LOCATED IN THE CONTROL TOWER CAB, REASON BEING THAT THE TOWER CAB IS BEING REMODELED FOR COMBINED FLIGHT SERVICE AND CONTROL TOWER USE.

PILOTS ARE REQUESTED TO USE CAUTION IN ENTERING AND LEAVING THE TRAFFIC PATTERN.

HUGH R. KELLEHER, AIRPORT MANAGER

A study of the orbit of Vanguard I shows that sunlight has exerted enough pressure on it to shift the course of the satellite about one mile a year. This is many times the force scientists expected to find.

INCREASED BILLINGS AIR TRAFFIC
220,000 LANDINGS PER YEAR

The following is the number of aircraft movements during the Billings Air Fair this summer:

Friday, August 26, 1960	436
Saturday, August 27, 1960	516
Sunday, August 28, 1960	774
Average Day	330

Kenneth J Rolle,
Airport Manager

FLYING IN MEXICO

Aircraft traffic between the United States and Mexico shows a steady increase and our good friend, Thomas B. Lee, Operations Manager for Trans Mar de Cortes S. A. Airlines from South of the Border has provided from time to time invaluable information to make flying a bit easier in Mexico. This information is provided in a spirit of cooperation and friendliness to make flying between the two countries as pleasant, as safe and as efficient as possible.

For the benefit of our readers, we are reproducing in its entirety a letter which was recently received from Mr Lee who is stationed with Trans Mar de Cortes in La Paz, B C.

ARIZONA AVIATION AUTHORITY
3000 SKY HARBOR BLVD.,
PHOENIX, ARIZONA

Gentlemen:

From time to time we hear of Aircraft from the States, landing in wheat fields, cow pastures and swamps that used to be Airports, and are shown as such even on the most up to date WAC charts. This is quite a common occurrence in our part of the country, where new Airports with paved runways, navigational facilities, etc., have been opened in the last few years. Such is the case of Ciudad Obregon and Culiaean

In as much as Aircraft from the States has increased considerably in the past few years, especially from the Southwestern States in to Northwestern Mexico, we should like to make a few suggestions, which you may pass on to your readers, that will make locating our Airports a bit easier, and avoid landing in somebody's back yard.

1. Radio Aeronautica Mexicana, S. A., (R.A.M.S.A.), Melchor Ocampo No. 469-101, Mexico, D. F., publishes a very good manual showing all airways with their pertinent information, plus all instrument approaches at all fields having such facilities. The Format is the approved ICAO design and very readily understood. The manual is called "Manual de Facilidades y Procedimientos de Navegacion R.A.M.S.A." You can write to them in English, even though it is published in Spanish.

2. A USAF Radio Facilities Chart for the Caribbean and South America Area is an excellent and up to date publication. Very handy to carry and easy on the pocketbook.

3 Mark your WAC charts with the correct Field Locations. Coordinates are to be found on the instrument approach charts. Actual field location are quite often to be found as much as 10 miles from where shown on WAC charts; and are often very cleverly hidden so as to make spotting them, from a low altitude and under poor visibility, quite a chore.

4 All towers transmit and receive on 30235 KC and are rapidly installing VHF equipment. 118.1 MGC is the primary VHF frequency that towers transmit and receive. They also guard 122.5 MGC.

5. Most tower operators will welcome the opportunity to practice their English. Suggests that contacts are made as distinct as possible. As extreme accents are not readily understood anywhere, especially in a country where English is a foreign language, use regular U. S. approved aeronautical terminology.

6. WAC Charts are undoubtedly the best Navigation Charts available, but they are notoriously erroneous in their altitude representation over the mountainous country of Mexico, which is practically all of it. They error on the low side by as much as 3,000 feet in some on the mountain ranges, in northwestern Mexico.

7. We have a very keen group in our Civil Aviation Authority (Direccion de Aeronautiea Civil), headed by Ing. Alberto Acuna Ongay. We are sure that any further or specific information you may require, or complaints that you may wish to lodge, will be readily handled.

We are enclosing a copy of the Ciudad Obregon and Culicacan R.A.M.S.A. Format. These were made on an Office Duplicator, consequently much of the fine print did not show up, but they will give you an idea of what you may expect.

If we may supply any further information or be of any service to you, please do not hesitate to call upon us.

Very truly yours,
TRANS MAR DE CORTES, S. A.

MISSOULA M.P.A. MEETING

The Missoula Hangar of the MPA held a regular Fall meeting in Missoula on October 21 at the Airport Cafe on the Missoula County Airport.

A feature of the meeting, which was well attended by Missoula pilots, included the presentation of the pilot of the year plaque by Scott Stanley, MPA President, to Fred Gerlach, who is a helicopter pilot employed by the Johnson Flying Service.

The Missoula Hanger plans on establishing a pilot lounge in the terminal building. It is interesting to note that the present officers of the Missoula Hangar are all lady pilots and they are setting an enviable example in the stimulation of MPA activities.

MONTANA AIRPORT DIRECTORY

The Montana Aeronautics Commission now has available an Airport Directory for Montana. This directory includes flight information in Montana and a diagram of the location of Municipal, Recreational and Emergency airports. This booklet has been prepared at the request of Montana pilots and is designed to be carried in the airplane for ready reference on current information pertaining to Montana airports.

The boklet will be mailed to all registered pilots in the State or copies may be obtained at a cost of $2.00 each from the office of the Commission in Helena, Montana.

Montana pilots who register for the calendar year 1961 will receive for their registration fee copies of this Newsletter, printed by the Montana Aeronautics Commission during the year 1961, and a copy of the new Montana Airport Directory, published by the Montana Aeronautics Commission. Distribution of the Airport Directory will be made immediately after January 1, 1961.

ANNUAL PILOT REGISTRATION

It is required by the Laws of Montana that all pilots flying aircraft in Montana, except airline pilots, to be registered with the Montana Aeronautics Commission annually.

Registration forms may be procured from the Flight Operator at any municipal airport or by contacting the office of the Montana Aeronautics Commission, Box 1698, Helena, Montana. The registration form is included with this newsletter for your convenience.

The required $1.00 registration fee is used to help finance search and rescue operations pertaining to lost aircraft. The search and rescue organization established by the Montana Aeronautics Commission participates in approximately thirty search incidents per year, with three to five incidents involving organized search by air directed by one or more of the search coordinators appointed by the Commission.

AGRICULTURAL PILOT REGISTRATION

It is required by the Montana Aeronautics Commission that all pilots flying agricultural aircraft be registered with the Montana Aeronautics Commission as an agricultural pilot. It is required that all agricultural aircraft operated in Montana be covered with Public Liability and Property Damage insurance.

Agricultural pilots may register on the same form that is provided by the Commission for pilot registration. If you are an agricultural pilot, be sure you fill out the pilot registration form completely including the part pertaining to the registration of agricultural pilots.

RADAR FOR GROUND TRAFFIC CONTROL

A new radar, which provides Federal Aviation Agency air traffic controllers with a detailed picture of vehicles on the ground, has been put into operation at Washington National Airport to help speed the landings and takeoffs of aircraft and improve safety factors at the airport.

The Airport Surface Detection Equipment (ASDE) radar antenna sweeps the field once every second and gives a detailed picture of ground traffic, moving or still, on the surface of the airport. Since visible light is not required to obtain the picture given on the ASDE scope, it is fully effective during darkness or fog, when human vision is handicapped by limited visibility.

The installation by FAA of instrument landing systems (ILS) and Airport Surveilance Radars (ASR) at major airports throughout the nation has speeded up landings during instrument weather so that the rapid clearing of runways has become an impotrant factor for airport operations. This is due to the fact that the number of aircraft which can land or take-off can be limited by the ability of the control tower controller to see and direct ground traffic.

This is the third in the current program of 10 ASDE instalaltions. ASDE equipment is now operating at Newark, Idlewild and Washington and the remaining seven are scheduled for Boston, Seattle, San Francisco, Cleveland, Los Angeles, Portland and the new Dulles International Airport, under construction at Chantilly, Virginia.

Information obtained by the radar is displayed on a scope in the control tower. The picture resembles a relief map with runways and taxiways outlined by bright lines of light. Buildings and other objects are easily seen. Experienced operators can frequently distinguish between two and four-engined aircraft.

ICE

Accidents and critical incident reports reveal that many private and professional pilots may not be aware of the many ways in which icing can seriously affect the pilot's ability to maintain flight control during instrument flight. It is also known that many operators are unaware of the kind and amount of protection needed to cope with light, moderate, or heavy icing conditions.

External icing (impact, rime, clear, etc.) is most probable when flying in air with visible moisture (cloud, drizzle, rain, or wet snow) and at temperatures from 32°F to 20°F. Even in air temperatures as low as —30°F, there are many known cases of encountering heavy icing when flying in such supercooled moisture conditions. Depending upon the degree and form of moisture present, and upon the air temperature, ice accretions on an airplane's wing and other external surfaces may form slowly or with alarming and dangerous rapidity.

Internal carburetor system icing is most likely to occur in temperatures between 40°F and 60°F but can occur in air temperatures as high as 90 F. It is not necessary to have visible moisture present for this type of icing. The particular temperature range and the degree to which a carburetor is subject to icing is dependent upon its particular design and installation. For this reason, the pilot should refer to the airplane manufacturer's manual on the operation of the engine for detailed information on how to cope with carburetor icing. However, there is one aspect of carburetor icing that has been revealed in more recent accident and incident reports that will be covered below, namely, high altitude carburetor icing.

General aircraft operators must rely upon the U. S. Weather Bureau's forecasts and reports to predict icing conditions ahead. The definitions of these conditions as used by the Bureau are as follows:

Light icing—An accumulation of ice which can be disposed of by operating de-icing equipment, and which presents no serious hazard. Light icing wil not cause alteration in speed, altitude or track.

Moderate icing—An accumulation of ice in which de-icing procedures provide marginal protection; the ice continues to accumulate, but not at a rate sufficiently serious to affect the safety of the flight unless it continues over an extended period of time.

Heaving icing—An accumulation of ice which continues to build up despite de-icing procedures. It is sufficiently serious to cause marked alteration in speed, altitude, or track, and would seriously affect the safety of the flight.

FLIGHT HAZARDS FROM ICING

The basic and critical icing hazards in flight are as follows:

1. Icing of outside pitot/static pressure sources and venturi units.

    a. **Erroneous airspeed, altimeter and rate of climb indications.**

    Whenever the pitot or static air pressure sources or lines freeze fully or partially, the airspeed, altimeter, and rate of climb instrument indications will no longer be correct. This grave situation can cause the pilot to exceed the airplane's limitations unknowingly, to break up the airplane in flight, or to fly unknowingly into the ground.

    b. **Erroneous direction and attitude indications.** Those airplanes that utilize an outside venturi unit to provide power for vacuum driven gyros, and which are not located within the engine's exhaust gases, are very suceptible to ice accretions on the venturi tube. This in turn reduces the vacuum and the gyro will no longer give accurate attitude or direction indications. (The pilot must have at least one properly functioning gyro instrument to maintain flight control on instruments.

2. **Accumulation of dangerous ice loads on the wing and tail surfaces.** This situation changes the airflow and reduces the available lift while increasing the load the wing has to carry. It can also jam flight control surfaces if the buildup occurs near hinge points or between fixed and moveable flight surfaces. In extreme cases, the combined effects of ice load and loss of lift will force a plane down. Further, the wing will stall out at considerably higher than normal stall speeds.

U. S. POSTAGE
PAID
HELENA, MONT.
Permit No. 2

Mrs. Loretta B. Peck
School of Mines
Butte, Montana

News Letter

P. O. Box 1698
Helena, Montana

Form R-61

PILOT REGISTRATION — 1961

Montana Aeronautics Commission

Box 1698 Helena, Montana Phone HI 2-8160

Name .... First .... Initial .... Last .... (Please Print)

No. .... Leave Space Blank

Mailing Address .... (Please Print)

City ....

County ....

Phone Res. ....

Phone Bus. ....

F. A. A. Pilot Certificate No. ☐

Registration Fee $1.00

Airplane Owner

Aircraft No.

Make

Radio Receiver L F ☐ V H F ☐

Transmitter Frequency

Private Aircraft

(Check)

- Student Permit ☐
- Private ☐
- Commercial ☐
- Flight Instructor ☐
- A & P Mechanic ☐
- Ground Instructor ☐
- Airplane Owner ☐
- Commercial Flying ☐
- Montana Pilots Association ☐
- Flying Farmers ☐
- Airport Owner ☐
- Civil Air Patrol ☐
- Military Pilot ☐
- Executive Pilot ☐
- Ninety - Nines ☐
- AGRICULTURE PILOT ☐

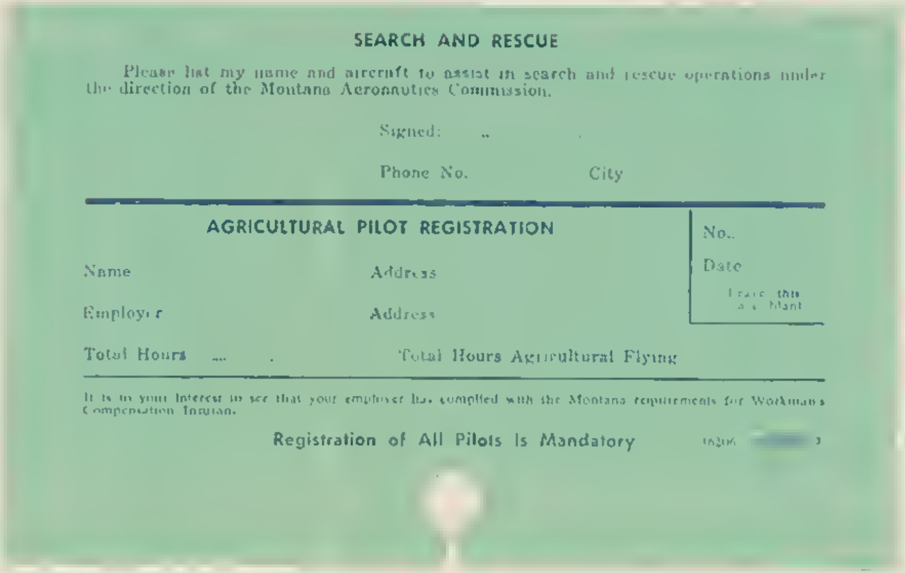
Date 1961

Signature ....

(OVER)

Will you volunteer your service and the use of your Airplane for Search and Rescue?

(SEE OTHER SIDE)



SEARCH AND RESCUE

Please list my name and aircraft to assist in search and rescue operations under the direction of the Montana Aeronautics Commission.

Signed:

Phone No. City

AGRICULTURAL PILOT REGISTRATION

No.

Date

Leave this space blank

Name Address

Employer Address

Total Hours Total Hours Agricultural Flying

It is to your interest to see that your employer has complied with the Montana requirements for Workman's Compensation Insurance.

Registration of All Pilots Is Mandatory

16306